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ISN 77.29
June 1977

$g_{9/2}$ PROTON-HOLE AND $h_{11/2}$ PROTON-PARTICLE IN ODD-A Cs NUCLEI

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Presented at the International Conference on Nuclear Structure, Tokyo, Japan, September 5-10, 1977

Laboratoire associé à l'Institut National de Physique Nucléaire et de Physique des Particules

$g_{9/2}$ proton-hole and $h_{11/2}$ proton-particle in odd-A Cs nuclei

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The rotor-plus-particle model originated from observation of decoupled bands in odd-A La isotopes [1]) and many subsequent experiments have verified its applicability in the transitional regions.

Results are reported here on similar band-structures observed in ^{121,123,125}Cs nuclei produced by ^{112,114,116}Sn(^{12}C,p2n) reactions at the Grenoble variable energy cyclotron and identified mainly by means of p-γ coincidences.

We observe cascades of strong stretched E2 transitions which we assign, in disagreement with earlier work [2]), to the $h_{11/2}$ decoupled band generated in the cesium isotopes from a proton in the $1/2^-(550)$ orbital. As expected, the favored members of these $\Delta I = 2$ bands have energies (relative to the $11/2^-$ isomer) very similar to the ones of the ground-state band in even-even Xe cores (fig. 1). In addition, a $\Delta I = 1$ band (fig. 2) is found here for the first time in odd-A Cs isotopes. This band is believed to originate from a hole in the $g_{9/2}$ proton shell. Such an assignment agrees with the observation [3]) of a 9/2 isomer in ^{121}Cs. This new band is characterized by rotation-like spacings (fig. 2) and by M1+E2 transitions having positive δ(E2/M1) mixing ratios typical of a proton-hole configuration. The experimental results for both $h_{11/2}$ and $g_{9/2}$ bands imply prolate shape for the odd-A $^{121-129}$Cs nuclei [4]).

References : 1) J.R. Leigh et al., Nucl. Phys. A213 (1973) 1.

2) J. Conrad and R. Repnow, Z. Phys. A276 (1976) 403.

3) C. Ekström et al., Proc. 3rd Int. Conf. on Nuclei far from Stability, Cargèse (1976) p. 193.

4) Data relative to ^{129}Cs are from J. Chiba et al., Univ. Tokyo, Progr. Report UTPN-50 (1974) p. 44.

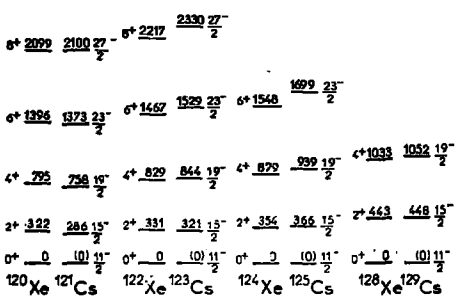

Fig. 1

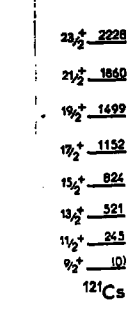

Fig. 2